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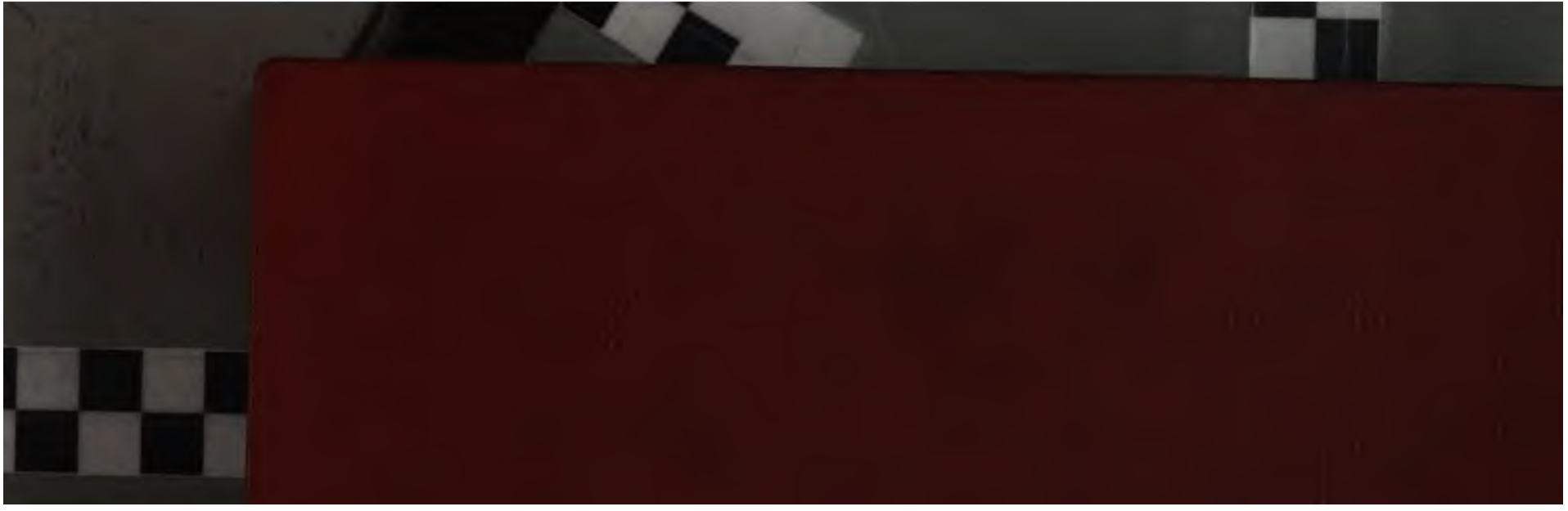

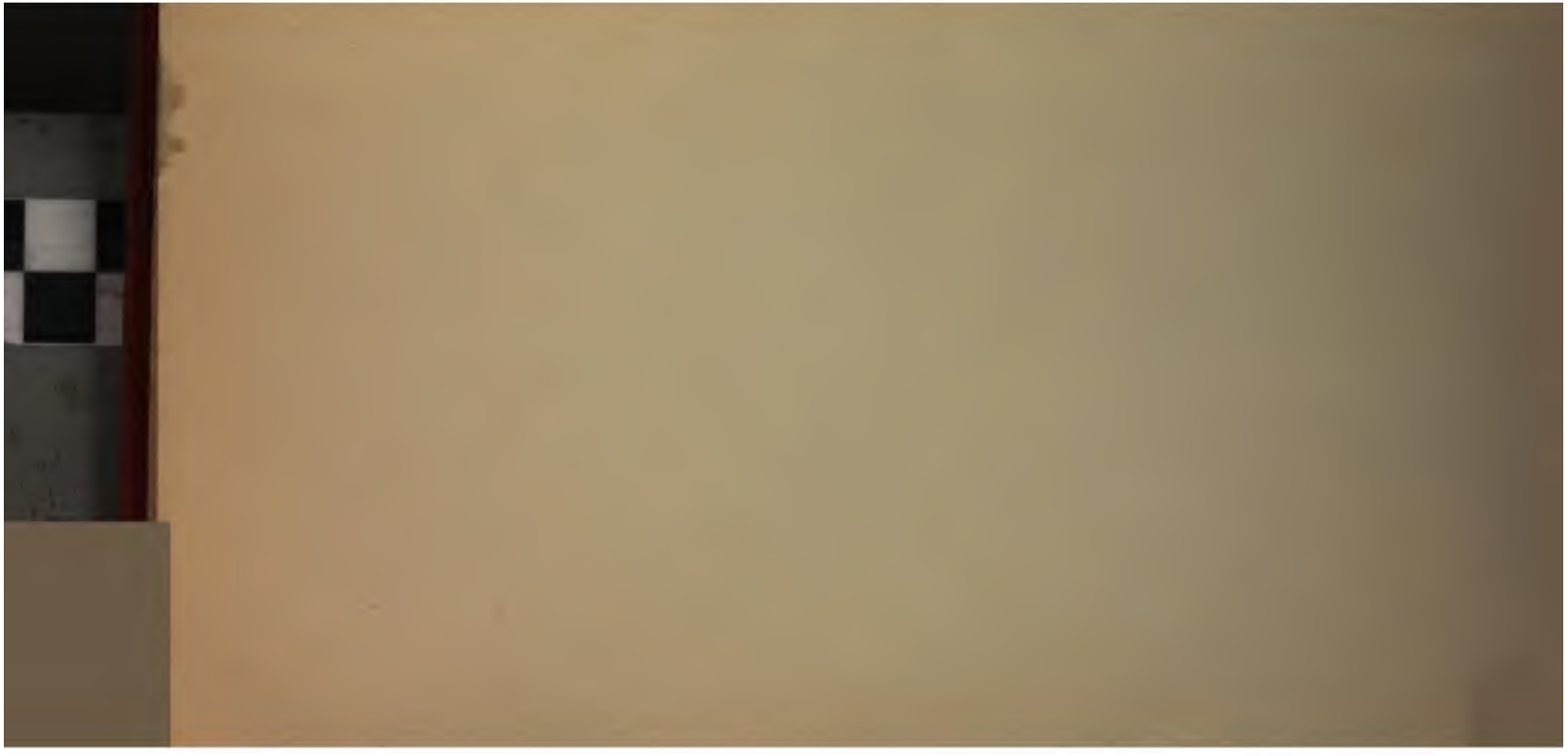

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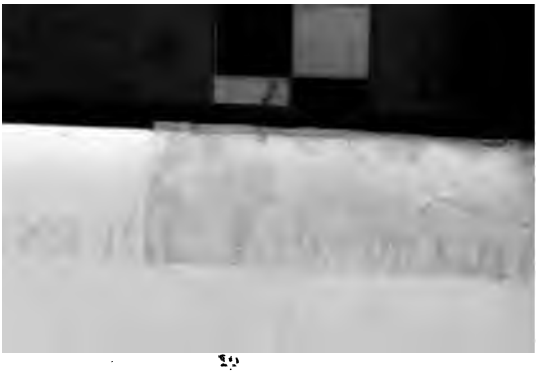

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MEMOIRS.

Notes *of a* Course *of* Practical Histology *for* Medical Students. Given in King's College, London, by Wm. Rutherford, M.D., F.R.S.E., Professor of Physiology.

At the present time there is much discussion regarding the manner in which Practical Physiology should be taught to medical students. Perceiving the difficulties which physiological teachers have to encounter in carrying out the new regulations of the College of Surgeons, the Editor of this Journal has asked me to give a *résumé* of my course of Practical Histology. I do not regard my course as perfect, nevertheless I have found it work successfully through several years, and; after having ascertained the modes of tuition adopted elsewhere in this country and in Germany, I have come to the conclusion that on no other system does the student accomplish so much in so short a time.

The system of teaching is essentially that adopted by my old master, Professor Bennett, of Edinburgh, the gentleman who first taught Practical Histology in this country. Under Professor Bennett's direction I taught the subject in a manner differing somewhat from that which I now adopt. In Edinburgh, the students of my ordinary class merely examined the tissues. I now find no difficulty in providing every pupil with the means for making for himself a little cabinet of microscopic specimens of the various tissues. This involves little trouble, and greatly increases the interest with which the student follows the class.

It is not advisable to teach more than five-and-twenty or, at the outside, thirty students at a time. To teach even this number satisfactorily requires three skilled assistants—senior students who have been through the course, and can assist the uninitiated. The whole of Histology may be gone through in twenty-four lessons, each lesson lasting from an hour and a half to two hours. The tuition of this class is more laborious than that of any other with which I am acquainted: the chief cause of the labour is the manipulation of the micro-

scope. If the microscope be one that is thoroughly satisfactory, such as Hartnack's, the labour of tuition is light; but if it is one of those clumsy machines so commonly met with in this country the labour is fearful.

The microscope which, in my opinion, is by far the best, both for the student and any one who wants really to work, is that made by Hartnack. It is so easy to work with it. The stage is just high enough to permit of the hand moving the slide without the arm being raised from the table. That expensive and time-wasting apparatus, the moveable stage, is absent. I generally recommend this apparatus for persons who cannot learn how to properly regulate the movements of their fingers. The coarse adjustment is effected by sliding the tube up or down without the use of a rack and pinion—another expensive and useless addition. Some persons say, that without the rack and pinion the student will bring the lens down on the cover-glass, and break the preparation or, it may be, the lens. After having given twenty-six courses of Histology, and after having taught some five hundred students, I am glad to say that I never had a lens injured, and I have only had two covering glasses of preparations broken in this way. The student only requires to be carefully instructed on this point when he begins to work with the microscope. Hartnack's lenses, too, are so excellent, that the student can easily see things clearly, and not in a mist, as is the case with most English cheap lenses, and with the majority of Gundlach's 1-8th, which find their way to this country. In the matter of microscopes tastes vary much, of course; but, for my part, I can say, that while I have found it satisfactory and comparatively easy to teach a class with Hartnack's microscope, I have found it terrible labour to do so with the ordinary educational microscope of these realms, with its great long tube, always needing the pillar to be bent, or compelling one to stand in order to look through it when it is vertical, its stage far too high, &c. I therefore think, that the first great essential for the successful tuition of Histology is to place the student in possession of a thoroughly good microscope on Hartnack's model. Such microscopes are made by Mr. Crouch, but his lenses, though superior to the general run of Gundlach's 1-8th's, are not quite equal to Hartnack's.

Some teachers give the student a programme of what he is to do at each lesson, and let him proceed to work upon it independent of the other students. The argument urged in favour of this plan is, that the good are not held back by the

stupid students, but are free to go on with the programme, and to execute it as rapidly as they like.

This plan is good when you have not more than half a dozen pupils and plenty of time to teach them. It involves your repeating to every student the remarks you may have to make. In my opinion, the plan is an utter failure if your time is limited, and the number of your students more than six or so. I have tried it with the number fourteen, and the best part of a day to teach them not a very long lesson. Nothing would tempt me to try it again in the tuition of an ordinary class. The plan I now adopt on all occasions is to treat my class like a regiment of soldiers, making every one do the same thing at the same time. The interest is thoroughly kept up by making the class a sort of debating society. While every one looks at the same object, I ask one student after another to describe what he sees. The observations of one student are in this way checked by the observations of another. The class resembles a little army of investigators—it is, in fact, a miniature of the histological world. The power that every student has of criticising the observations of his fellows makes, as might be supposed, every one exceedingly careful. A simple object like yeast is taken first. I give no description of the torula, but I ask the student to describe and then to draw what he sees. Any one may be called upon to do this. Any one who disagrees with any statement is asked to do so, and to give a demonstration in support of his opinion. To facilitate such descriptions every student has a card on which are printed the following points:—1. Shape. 2. Edge. 3. Colour. 4. Transparency. 5. Contents. 6. Size. 7. Effects of reagents. The card prevents the student from getting bewildered, and teaches him method and thoroughness. Care is taken that no one ever becomes idle. If his preparation is made, and he be waiting on his neighbours, he occupies his time in drawing. When we come to complex structures, such as bone, I give a brief preliminary account of the subject, in order that every one may understand what he sees. By questioning the student as the demonstration goes on, it is easily ascertained whether he understands what he is about. On all occasions, however, I endeavour to make the student describe what he sees. This method really *educates* him in a way such as no other method, in my opinion, can. When necessary I show preparations which have been previously made. With a subject like teeth this is, of course, necessary, but whenever it is possible each student makes his own preparations, and preserves them when they are worth keeping.